Biochemical markers for diagnosing and monitoring of acute pancreatitis

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When the pancreatic cells are inflamed, enzymes and inflammatory mediators are released from them causing damage to the tissues. Some of this substances are currently used as biochemical markers and others show potential to be used as markers, with further research.

Enzymes amylase and lipase, the proenzyme trypsinogen and the C-reactive protein

Procalcitonin
an important protein of the acute phase with concentrations directly proportional to the severity of the disease

Serum amyloid A
a protein released during inflammation and specifically in acute pancreatitis, its levels are expected to increase

Interleukins
IL6 acts as an inducer of hepatic CRP synthesis,IL-8 is a secondary mediator in neutrophil activation. IL-10 is an anti-inflammatory cytokine

Tumor necrotizing factor α
a protein released by monocytes, macrophages and acinar cells which levels rise in the early stages of the disease

Matrix metallopeptidase-9
an enzyme involved in the breakdown of extracellular matrix. In acute pancreatitis, levels are is increased.

Polymorphonuclear elastase
an enzyme involved in the degradation of the extracellular matrix during the early stages of acute pancreatitis

Adhesion molecules
their increased serum levels are employed for early diagnosis of AP

Phospholipase A2
an enzyme released by the pancreas in an inflammatory state

Hydrogen sulfide and substance P
cause local vasodilatation and increased microvascular permeability which lead to the accumulation of leukocytes

Carboxypeptidase B activating peptide
its levels increase from the onset of symptoms over 72 hours

Poly-C avid ribonuclease
a marker for the destruction of pancreatic tissue that has a high specificity in the first 3 days of the disease

Hepcidin
its levels increase during inflammation as a result of an increase of IL-6 levels.

Copeptin
a glycopeptide that is co-synthesized with vasopressin. During acute pancreatitis, they are released in the bloodstream.

Soluble E-selectin
during acute pancreatitis, activated neutrophils release elastase, which damages the endothelium and release of sTM and sES occurs

Adipokines
massively released into the bloodstream, due to pancreatic necrosis.

Melatonin
variations of melatonin concentration in the serum might reflect the degree of AP severity

Endothelin I
it is released alongside vasopressin in the bloodstream in a state of inflammation. Its levels in acute pancreatitis rise

Further studies investigating these markers among large cohorts with specifically designed protocols are expected to elucidate their precise association with the AP pathology and define their applicability as diagnostic, prognostic markers or targets for effective drug therapy.

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